SEM | TEM | MASS SPEC | NMR | ESR | EPMA | AUGER | FIB | SAMPLE PREP | APPLICATIONS EXPERTISE

JEOLink Newsletter

FEBRUARY 2018 | ISSUE #76

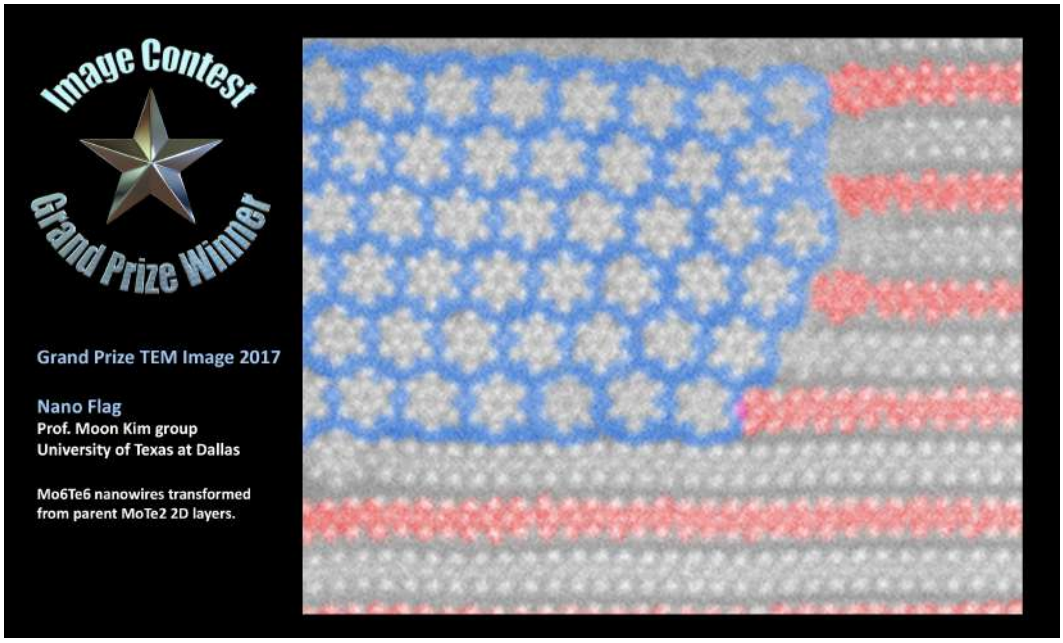
JEOL Solutions for Innovation

Grand Prize Winners - JEOL Image Contest 2017

From all the images submitted in a calendar year, we pick two Grand Prize Winners.

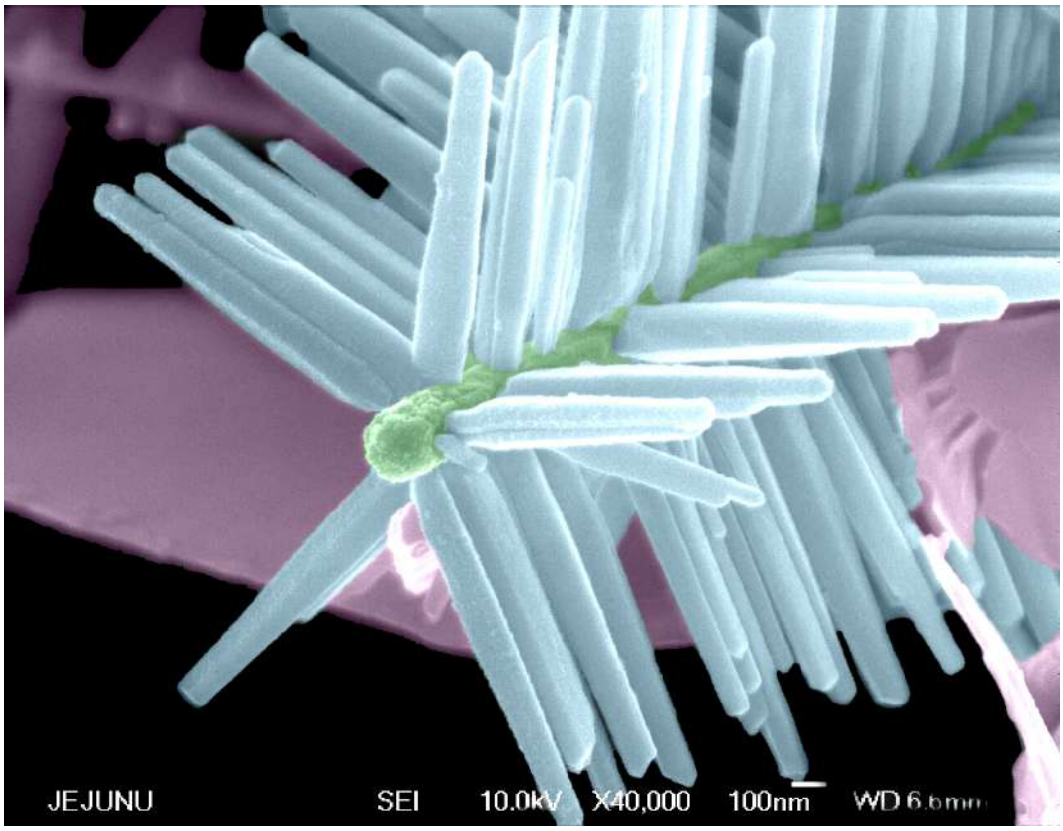
Please join us in congratulating Prof. Moon Kim at University of Texas at Dallas and Armin Vahid Mohammadi at Auburn University for their winning images!

Read more about Moon Kim's work with atomic resolution TEM where he is featured in our REALab article, and more about Armin's SEM images in our new blog post.



January 2018 Image Contest Winner

Congratulations to Ulugbek Shaislamov, Research Professor at Jeju National University for his winning FE SEM image of an Ag/ZnO hierarchical nanostructure. See all the 2018 entries to date here.



Do you have a great image to share? Enter the JEOL 2018 Microscopy Image Contest!

Visit our website for how to enter the contest and win an Amazon gift certificate and be featured in the next JEOL calendar! View all entries or learn more about criteria for a winning image.

Order your 2018 JEOL Image Contest Calendar

We've mailed out all the calendars to those who have ordered them, but still have a few on hand. This is our 4th calendar featuring the winning images selected each month of the calendar year. Request your copy. Click here to order.

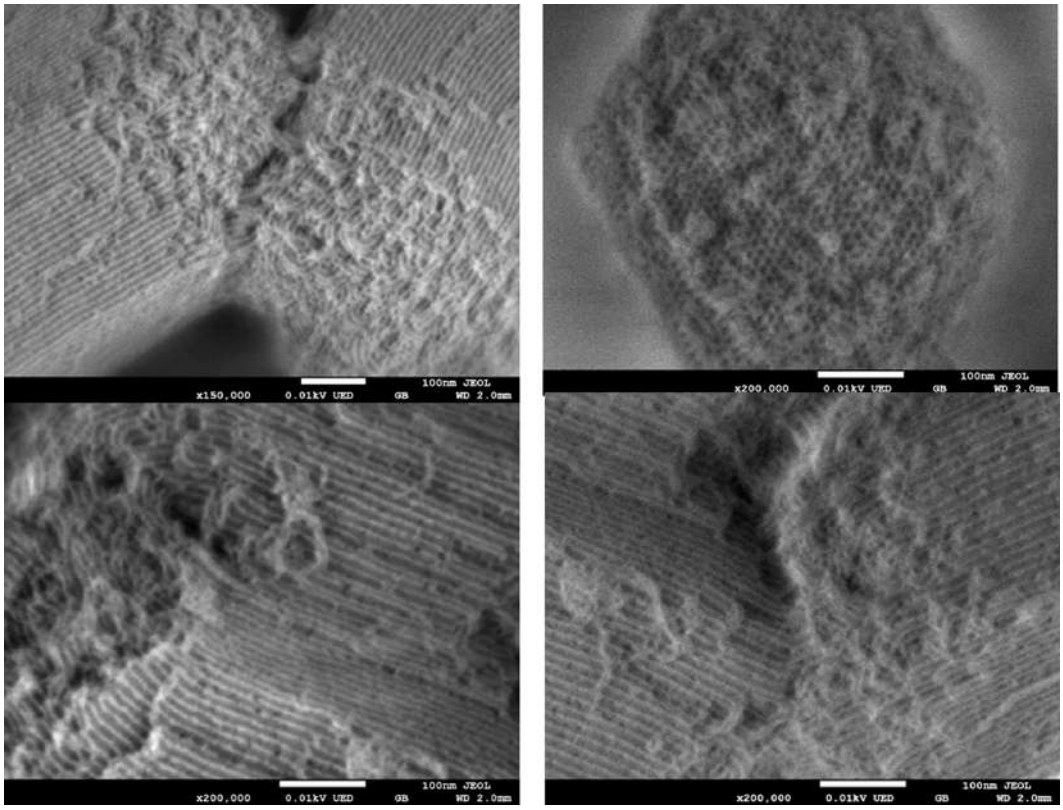
Some Thoughts on Low kV

What makes the difference between a good SEM image and a stellar one? Imaging samples at the appropriate conditions, and that often means at very low accelerating voltage (low kV). It's time to give it a try!

Every modern day scanning electron microscope (SEM) from the top of the line, ultra-high resolution field emission SEMs to the most economical entry level tungsten (W) thermionic SEMs has the capability of imaging samples at very low accelerating voltage (Low kV). Low kV imaging has many benefits and this easily accessible function should not be overlooked.

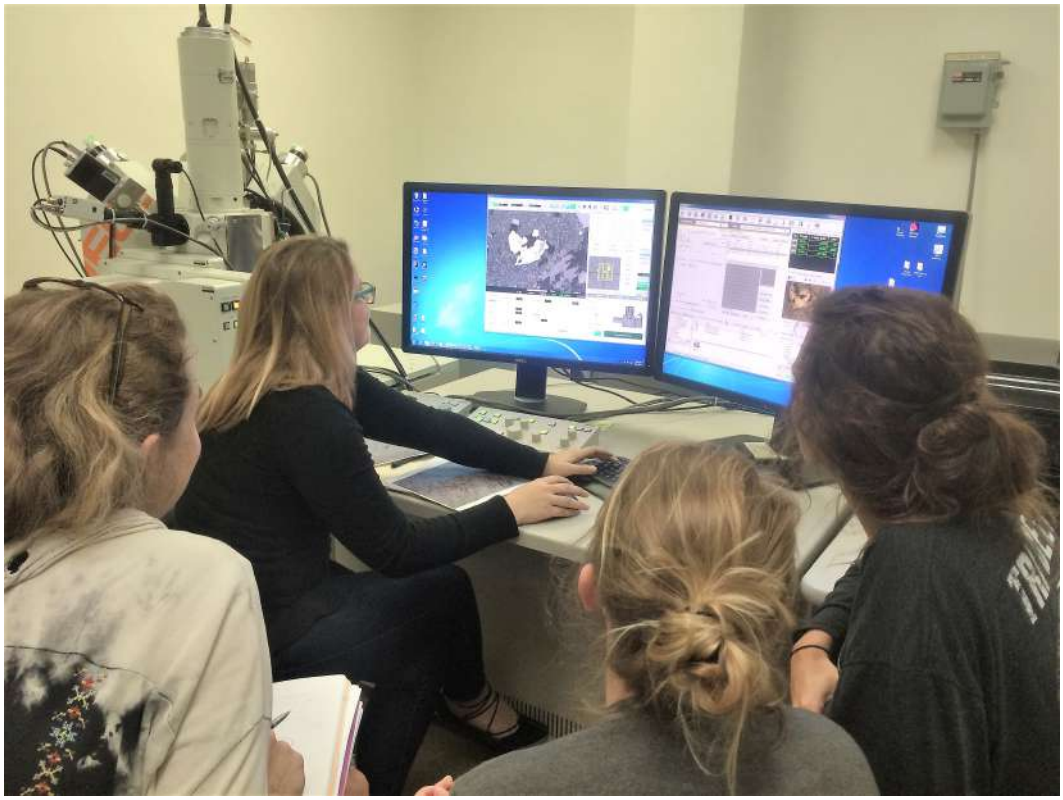
Read the full article>>>

The "extremes" - Ultralow SEI imaging down to 10 volts.



Sample: Mesoporous Silica which is: nonconductive, porous, has a poor SE yield, charges easily and has structures at the single digit nm scale. This type of sample needs to be imaged at high mag and ultra-low voltage to eliminate charging and edge effect. Conductive coating is not an option.

Geoscience Studies at LSU – The Pet Rock Project and Course-Embedded Research



It’s not common for a sophomore in college to get the chance to use sophisticated imaging and analysis equipment like an electron microprobe so early in their studies. That sets Louisiana State University apart, where undergraduates in the

geoscience program are immersed early on in geological research with hands-on experience using the EPMA, or Electron Probe Analyzer, often more commonly just called a microprobe.

Professors Darrell Henry, PhD and Professor Barbara Dutrow, PhD are both integrating the EPMA in their classes at LSU. They recently presented a poster on course-imbedded research and scientific communications at the Geological Society of America 2017 annual meeting. Read the full story >>>

Send us Your Selfie!

We're launching a new contest showcasing "selfie" (well, we mean pictures with you and/or your group) photos with your JEOL instrument - SEM/TEM/EPMA/NMR/Mass Spec!

JEOL will award four $100 Amazon Gift Certificates for the categories of:

- Coolest Operator/Instrument Photo
- Best Instrument Team Photo
- Vintage Charm Photo
- Serious Stuff Photo

Follow the link for more information and the entry form>>>

Share the love and show your style!

We'd like to thank Ke-bin Low and Qiao Qiao for use of this amazing "selfie" style photo taken at University of Illinois Chicago, at the ARM200F TEM, to help us start the contest.

In Case You Missed: Publications and Microscopy News

Measuring the Temperature of Two Dimensional Materials at the Atomic Level

Researchers at the University of Illinois at Chicago describe a new technique for precisely measuring the temperature and behavior of new two-dimensional materials that will allow engineers to design smaller and faster microprocessors. Their findings are reported in the journal *Physical Review Letters*.


The JSM-IT500HR.

Newly installed, Next-generation SEM Improves Analysis of Client Samples This high resolution SEM, installed in the McCrone Associates lab during December 2017, is the first instrument of its type installed outside the manufacturer's facilities. The new instrument will provide clients with improved SEM images and microanalysis for their most frequent projects without need of a separate FESEM analysis session, maximizing value and reducing project time.

ARM Opening Ceremony An opening ceremony for the Wuhan University/JEOL Collaboration Laboratory, home of the ARM200F Transmission Electron Microscope with Spherical Aberration Correction, was held in late November.

Many More Bacteria Have Electrically Conducting Filaments Microbiologists led by Derek Lovley at the University of Massachusetts Amherst, who is internationally known for having discovered electrically conducting microfilaments or “nanowires” in the bacterium Geobacter, announce in a new paper this month that they have discovered the unexpected structures in many other species, greatly broadening the research field on electrically conducting filaments.

“Carboranyl-cysteine”—Synthesis, Structure and Self-Assembly Behavior of a Novel α -Amino Acid - Numerous biological processes are dependent upon the inherent ability of some molecules to spontaneously self-assemble into highly ordered constructs which confer functional attributes, or which serve as the etiological agents in disease progression and pathogenesis. FE-SEM images show the self-assembled constructs formed from air evaporation of saturated ethanol and saturated water.

Electron Microscopy Unlocks the Answers to the Toughest Ceramics Questions *- Ceramics Expo News*

Understanding the Effects of a High Surface Area Nanostructured Indium Tin Oxide Electrode on Organic Solar Cell Performance The newly installed ARM S/TEM University of Alberta NanoFAB was used to characterize Organic Solar Cell materials.

Direct Detection Electron Energy-Loss Spectroscopy: A Method to Push the Limits of Resolution and Sensitivity Direct detection technology has previously been utilized, with great success, for imaging and diffraction, but potential advantages for spectroscopy remain unexplored. Here we compare the performance of a direct detection sensor operated in counting mode and an indirect detection sensor (scintillator/fiber-optic/CCD) for electron energy-loss spectroscopy. Dr. Mitra Taheri of Drexel University, co-author, explained that this was a grassroots effort - the authors co-developed the instrumentation with the aid of a special development grant from NSF. They are open to collaborators who wish to work with them using the instrumentation. This work was done using a JEM-2100F Transmission Electron Microscope.

See Us at These Upcoming Events

SPIE. ADVANCED LITHOGRAPHY

2/27 - 2/28 Advanced Lithography
Booth #130 - San Jose, CA

PITTCON 2018 CONFERENCE & EXPO

2/27 - 3/1 Pittcon
Booth #1419 - Orlando, FL - **Contact us for in-booth SEM and Mass Spec demos**

JEOL MIT.nano TOOL TALKS MIT.nano

3/14 What's New in NanoTools?

Advanced Applications of Microscopy (SEM and TEM), Auger, NMR, and Mass Spectrometry. March 14, 2018 | 9:00 a.m. - 4:00 p.m. | MIT http://go.jeolusa.com/e/234012/2EkW0pX/3sgs5/115434260?h=sExqRR_1LPTHGE-fFZaHFNg2QEsXTbfp-4xfhz14sUA

2018 **Calendar of Events** - See us at these upcoming conferences and meetings!

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Stay in touch with us at JEOL USA and share in the fun and some valuable information. Besides, we like to see you there!

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Contact us at jeolink@jeol.com.

Our 2018 **Calendar of Events** is now online. See us at these upcoming conferences and meetings!

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